Remarks

The Office Action mailed August 10, 2004 has been carefully considered. After such consideration, Applicant amended claims 1, 8, 10, and 11. Support for the recited concentrations of sulfuric or hydrochloric acid can be found in the specification on page 10, lines 14-16. Support for the recited concentrations of oxalic acid concentration can be found on page 10, line 15 and in Table 3.

The Office Action rejected Claims 1, 2, 4, 7, 8, and 10 under 35 U.S.C. 103 as being unpatentable over US Patent 4,816,078 issued to Schiweck in combination with the following viewed collectively: US Patent 4,831,127 issued to Weibel-1, US Patent 5,008,254 issued to Weibel-2, Saha et al. *Applied Microbiology and Biotechnology* (1996), Vol. 45, Pages 301-306, and Gatzi et al. *Helv. Chim Acta.*(1938), 21, pages 195-205.

Schiweck relates to a process for production of crystalline L-arabinose. The process of Schiweck uses araban as raw material. Araban is a polysaccharide, which mainly consists of arabinose. On page 119 of "Dictionary of Carbohydrates," which is attached hereto, araban is explained as a "polymer of linearly α-(1→5)-linked L-arabinofuranose units with single L-arabinofuranose α-(1→3)-linked to the main chain at intervals. Thus it is natural that the process of Schiweck mainly produces arabinose because the raw material thereof is araban.

Further, sugar beet pulp contains not only araban, but also pectin. In lines 21-26, column 3 of Weibel-2, it is described as follows: "In the case of sugar beet pulp, the extracted complex is composed of high molecular weight polysaccharides whose composition is largely L-arabinose, D-galactose, and D-galacturonic acid. The generic term for the dominant polysaccharide (in sugar beet pulp) is "pectin"." As such, pectin mainly consists of galacturonic acid, wherein arabinose, etc. is partly linked thereto as side chain. Please see page 129 of "Plant Cell Wall Analysis," which is also attached hereto.

Applicant further suggests that araban can be decomposed with weak acid, whereas pectin is barely decomposed with acid because it mainly consists of galacturonic acid. Schiweck discloses a technique to extract only araban with alkali and then decompose the extracted and separated araban in order to suppress the influence from compositions other than araban such as pectin. Conversely, Weibel-1 discloses a technique to perform acid-

hydrolysis with strong acid in order to decompose the pectin. Thus, the techniques of Schiweck and Weibel-1 contrast with one another. If one wishes to obtain L-arabinose, one should extract araban and decompose it with weak acid, while if one wishes to obtain decomposed product of pectin, one should decompose pectin itself with strong acid. Therefore, if one combines the techniques of Schiweck and Weibel-1, one can merely achieve a technique to obtain L-arabinose and decomposed product of pectin from sugar beet.

While there has been a long felt need in the industry for higher yields of L-arabinose, these prior art references have existed for many years without having been combined, suggesting non-obviousness. Satisfaction of a long felt need, as here, by an invention is an indicator of non-obviousness.

The present invention, on the other hand, restricts the raw material to envelopes of corn grain. Envelopes of corn grain are composed of xylan, which basically consists of β-(1→4) linkage of D-xylose. L-arabinose is contained in xylan as β-(1→3) linked side chain, but the composition ratio of L-arabinose is much smaller than that of D-xylose. As noted, Schiweck's technique is to obtain L-arabinose by decomposing araban, which mainly consists of L-arabinose. Thus, the technique of Schiweck completely differs from the technique of the present inventions, which obtain L-arabinose by decomposing xylan, which mainly consists of xylose.

In the technique of the present invention, xylan is decomposed without being previously extracted. Araban and xylan etc. are closely tangled with other cell wall polysaccharides, and thus in the technique of prior art, it is impossible to selectively decompose araban or xylan, etc. without previously extracting and separating the same. This can be understood from the fact that the technique of Schiweck involves alkali extraction. Also, we believe that the present invention involves sufficient inventive steps to distinguish this inventions from the prior art.

Saha teaches obtaining L-arabinose by acid-hydrolysis of corn fiber. However, Saha does not teach a process for selectively decomposing L-arabinose. Thus, Saha never teaches the technique of the present invention.

The acid-hydrolyzing conditions defined in the present independent claims result in selective production of L-arabinose contained in envelopes of corn grains. On the contrary,

none of the references cited disclose such concrete acid-hydrolyzing conditions, which are especially suitable for selective production of L-arabinose.

By this amendment Applicant has placed the case in condition for immediate allowance and such action is respectfully requested. However, if any issue remains unresolved, Applicant's attorney would welcome the opportunity for a telephone interview to expedite allowance and issue.

Respectfully submitted,

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